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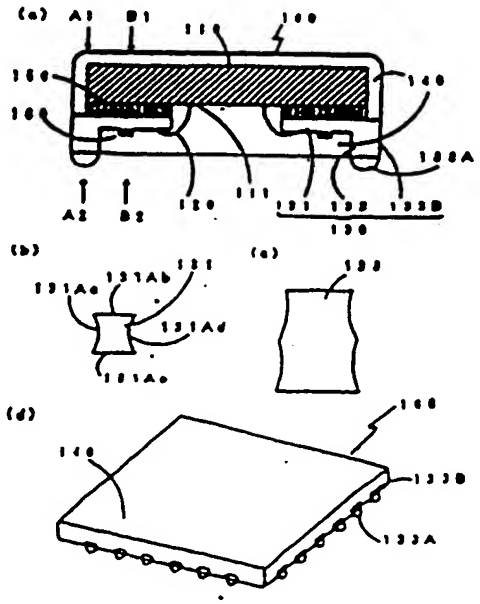
(54)【発明の名称】樹脂封止型半導体装置

(57)【要約】

【目的】　リードフレームを用いた樹脂封止型半導体装置であって、多端子化に対応できて高信頼性のものを提供する。

【構成】　2段エッチング加工によりインナーリード部の厚さがリードフレーム素材の厚さよりも薄肉に外形加工されたリードフレームを用い、且つ、外形寸法をほぼ半導体素子に合わせた、封止用樹脂により樹脂封止したCSP（ChipSize Package）型の半導体装置であって、前記リードフレームは、薄肉のインナーリード部と、該インナーリード部に対し、インナーリード部の外部側の端部においてインナーリードに交差する方向で、半導体素子搭載側と反対側に一体的に延出した、外部回路と接続するための端子柱を有するもので、該端子柱の外部側の面に半田等からなる端子部を設け、端子部を封止用樹脂部から突出させている。



substantially equal to a semiconductor chip in a dimension in X and Y directions except in a direction of thickness. The resin-encapsulated semiconductor device in accordance with the present invention means a semiconductor device employing a lead frame among the defined CSP type semiconductor device.

In the CSP type semiconductor device described above, the terminal portions made of solder are formed on each of the terminal columns and is externally exposed from the encapsulating resin, but the terminal portions do not necessarily need to be protruded from the encapsulating resin. Moreover, if necessary, the outside face of each terminal column which is exposed externally from the encapsulating resin may be covered with a protective frame by means of an adhesive.

[FUNCTIONS]

The resin-encapsulated semiconductor device in accordance with the present invention can meet a demand for an increase in the number of terminals and has a miniaturized structure and thus an increased mounting efficiency. At this time, in the resin-encapsulated semiconductor device, as the removal process of the dam bars by press working or the forming process of the outer leads as in the case of using a mono-layered lead frame

shown in Fig. 11b is not required, there is no problem such as bending or coplanarity of the outer leads due to this process. More particularly, the use of a multipinned lead frame shaped in a manner that inner leads have a thickness smaller than that of the lead frame blank by a two-step etching process, that is, the inner leads are arranged at a fine pitch, can meet a demand for an increase in the pin number of the semiconductor device. Moreover, as the resin-encapsulated semiconductor device is fabricated in such a manner that it is equal to that of a semiconductor chip in size, it can be miniaturized. In addition, each of the inner leads fabricated by a two-step etching process as shown Fig. 8 has a rectangular cross-sectional shape including four faces respectively provided with a first surface, a second surface, a third surface, and a fourth surface, the first surface being opposite to the second surface and flush with one surface of the remaining portion of the inner lead having the same thickness as that of the lead frame blank, and the third and fourth surfaces each having a concave shape depressed toward the inside of the inner lead. Thus, the second surface of each inner lead is flat, and is excellent in wire-bonding property. Moreover, as the first surface of each inner lead is flat and the third and fourth surfaces of the inner leads each have a concave shape depressed toward the inside of th inner